Question 9

CERTIFICATION AUDIT

40CFR60, APP. B, PS1

CONTINUOUS OPACITY

MONITORING SYSTEM (COMS)

Hoover Company

Main Plant Stack

LS541

428

MONITOR LABS

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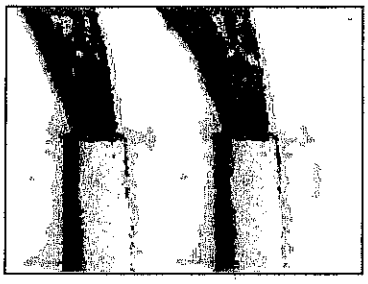

17-Dec-01

PREPARED FOR:
Hoover Company
Main Plant Stack
North Canton, Ohio

Monitor Labs, Inc., 76 Inverness Drive East, Englewood, Colorado 80112

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INTRODUCTION

Monitor Labs, Inc. was contracted to conduct a performance evaluation in accordance with USEPA 40CFR60, App. B, PS 1 on the opacity monitoring system located at the site stated below. All results are within specification.

Customer name	**Hoover Company**		
Monitor Location	**Main Plant Stack**		
Facility Location (city,state)	**North Canton, Ohio**		
Instrument Manufacturer	Monitor Labs		
Instrument Model #	LS541		
Instrument Serial #	428		
Today's Date (mo/dd/yr)	12/17/2001		
Monitoring Pathlength (in meters)(0.305m=1ft)	1.824		
Emission Outlet Pathlength (in meters)	2.44		
Flange to Flange Distance (in meters)	2.44		
OPLR	0.669		
Applicable Standard (% Opacity)	100		
Person Conducting Test	Aaron DiVito		
Date of Cal Error Testing (mo/dd/yr)	11/30/2001		
Low Neutral Density Filter Value	0.052	Tool No.	NBS-115
Mid Neutral Density Filter Value	0.149	Tool No.	SN-1466
High Neutral Density Filter Value	0.375	Tool No.	NBS-131

TEST PROCEDURES

Calibration Error Test

The Calibration Error Test was performed IAW paragraph 7.1.4 of the 40CFR60, App B, PS1. Low, mid, and high range filters certifiable to the National Institute of Standards and Testing were used. Fifteen non-consecutive tests were completed using the three filters (five readings with each filter). The calibration error is represented by the sum of the mean differences plus 95 percent confidence interval expressed as a percentage of the known filter value.

RESULTS

Test	Specification	Actual
Calibration Error (%)	≤ 3 %	1.23 Low
		0.42 Mid
		1.62 High

CALIBRATION FILTER SELECTION

Nominal attenuator optical density based upon Applicable Standard:

(ASTM D 6216, Section 7.5)

Calibrated Attenuator Opacity %		
Applicable Standard:	**10 - 19 % Opacity**	**> 20 % Opacity**
Low-range	5 - 10	10 - 20
Mid-range	10 - 20	20 - 30
High-range	20 - 40	30 - 60

Actual filter values:

(Actual Filters are chosen from filters with OD values closest to either *nominal* values or *desired* values.)

	Optical Density	Opacity %**	Tool No.
Low	**0.0523**	**14.88**	**NBS-115**
Mid	**0.1485**	**36.71**	**SN-1466**
High	**0.3748**	**68.48**	**NBS-131**

*IAW 40CFR60, App. B, PS1, 7.1.2, eq, 1-1

**Opacity % = $100*(1-10^{(-2*OD\_of\_Filter*OPLR)})$, IAW Opacity Monitor Instruction Manual

CALIBRATION ERROR DETERMINATION

Person Conducting Test	Aaron DiVito	Analyzer Manufacturer	Monitor Labs
Affiliation	Monitor Labs, Inc.	Model/Serial No.	LS541 / 428
Date	11/30/2001	Location	North Canton, Ohio

Monitoring System Output Pathlength Corrected? Yes x No ____ OPLR= 0.669

Calibrated Neutral Density Filter Values

Desired Optical Density (Opacity):		Path Adjusted Optical Density (Opacity):			Tool No.
Low-Range	10 - 20	Low-Range	0.0523 (14.88)		NBS-115
Mid-Range	20 - 30	Mid-Range	0.1485 (36.71)		SN-1466
High-Range	30 - 60	High-Range	0.3748 (68.48)		NBS-131

Run Number	Calibration Filter Value (Path-Adjusted Percent Opacity)	Instrument Reading (Opacity), percent	Arithmetic Difference (Opacity), percent		
			Low	Mid	High
1-Low	14.88	13.60	1.28		
2-Mid	36.71	36.40		0.31	
3-High	68.48	66.80			1.68
4-Low	14.88	13.90	0.98		
5-Mid	36.71	36.30		0.41	
6-High	68.48	67.20			1.28
7-Low	14.88	13.90	0.98		
8-Mid	36.71	36.40		0.31	
9-High	68.48	67.20			1.28
10-Low	14.88	14.20	0.68		
11-Mid	36.71	36.80		0.09	
12-High	68.48	67.00			1.48
13-Low	14.88	14.20	0.68		
14-Mid	36.71	36.60		0.11	
15-High	68.48	67.20			1.28
		Arithmetic Mean (Equation 1-3) x	0.92	0.24	1.40
		Standard Deviation (Equation 1-4) Sd	0.25	0.14	0.18
		Confidence Coefficient (Equation 1-5) cc	0.31	0.17	0.22
		Calibration Error % (Equation 1-6) Er	1.23	0.42	1.62

Remarks: *(1) Calibration Error <= 3% Opacity.*

APPENDIX A
FIELD TEST DATA

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GRAPHIC CONTROLS CORPORATION
0
20
40
60
80
100
2580
65.8
36.4
13.6
67.2
36.3
13.9
67.2
36.4
13.9
67.8
34.8
14.2
67.2
36.6
14.2
2580
13.6